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International Preliminary Examination Report

CLAIMS

1. A processing circuit for a spectrometry chain including a particle radiation detector (21),
5 including a charge preamplifier stage (20) receiving a pulsed current (I1) from the detector, representative of the amount of charges emitted by a particle which has interacted with the detector, an integrator stage (26), a differentiator stage (25) connected to the
10 charge preamplifier stage (20), the differentiator stage (25) receiving a signal (V1) from the charge preamplifier stage (20) and delivering to the integrator stage (26), a signal (V2), image of the detector current (I1), the integrator stage (26)
15 delivering an image (V3) of the amount of charges emitted by a particle which has interacted with the detector, characterized in that the integrator stage (26) is formed with an integrator which cooperates with means (28, 29, SW'1, SW'2) for controlling the
20 integration time substantially during the duration of each pulse of the detector current, the differentiator stage (25) being directly connected to the assembly formed with the integrator and means for controlling the integration time, the differentiator stage (25) and
25 the assembly forming a band-pass filter with self-adaptive time constants.

2. The processing circuit according to claim 1, characterized in that the charge preamplifier
30 stage (20) includes a discrete or integrated amplifier (A'1) mounted as a current integrator.

English translation of the amended sheets of
International Preliminary Examination Report

3. The processing circuit according to any of claims 1 or 2, characterized in that the differentiator stage (25) includes an operational amplifier (A') mounted as a differentiator.

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4. The processing circuit according to any of claims 1 to 3, characterized in that the integrator stage (26) includes an operational amplifier (A'2) mounted as an integrator.

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5. The processing circuit according to any of claims 1 to 4, characterized in that the means for controlling the integration time include a first switch (SW'1) inserted between the integrator and the output of the differentiator stage (25), a second switch (SW'2) for resetting the integrator to zero, a logic circuit (28) for controlling the switches, a comparator (24) for enabling the logic circuit (28) according to the result of a comparison between the signal, image of the detector current (B2), and a threshold (s').

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6. A spectrometry chain including a particle radiation detector (21), characterized in that it includes downstream from the detector (21), a processing circuit according to any of claims 1 to 5.

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7. The spectrometry chain according to claim 6, characterized in that it includes a circuit for acquiring (27) the signal (V3) delivered by the integrator stage (26) of the processing circuit, this

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International Preliminary Examination Report

acquisition circuit (27) including a analog/digital converter (27.2) followed by a memory (27.1).

8. The spectrometry chain according to
5 claim 7, characterized in that a signal (ACT) delivered by the logic circuit (28) conditions the acquisition time.

9. The spectrometry chain according to any
10 of claims 6 to 8, characterized in that the detector (21) is inserted with a resistor (R'p) into a divider bridge circuit.

10. The spectrometry chain according to any
15 of claims 6 to 9, characterized in that the detector (21) is a semiconductor detector.

11. The spectrometry chain according to
claim 10, characterized in that the semiconducting
20 material is selected from the group comprising CdZnTe, CdTe:Cl, CdTe:In.